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EXPENDABLE LAUNCH VEHICLES

# **NASA Launch Services**

**SMEX Phase A Kick-off Mtg  
May 1, 2001**

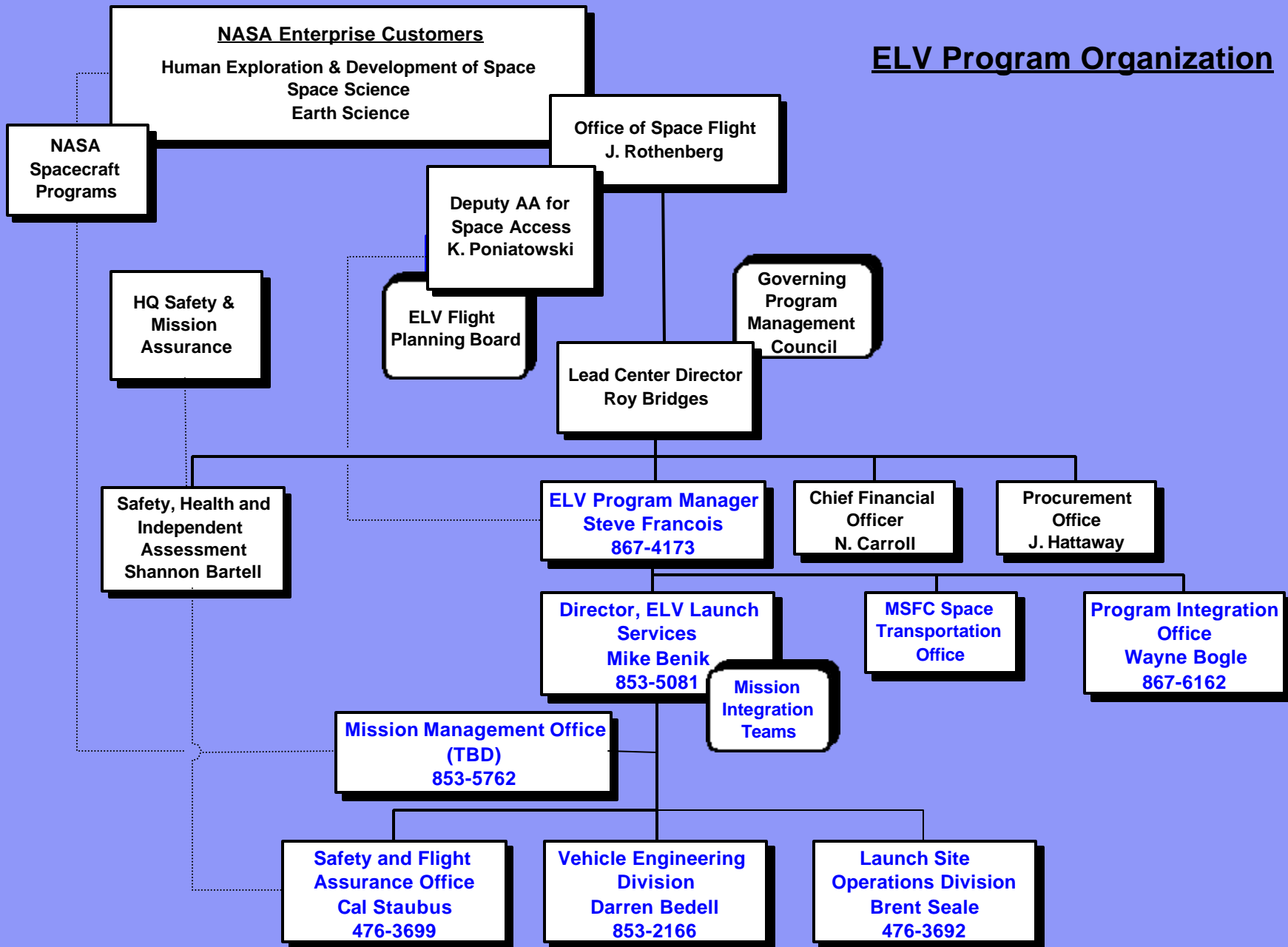
**Darrell Foster  
NASA/KSC/ ELV Launch Services  
Mission Management Office**



# NASA ELV Program Goals

- Ensure launch service contracts are in place to support approved NASA missions
- Provide Lead Center Program Management (budget, schedule, and technical) for NASA missions utilizing ELV Launch Services
- Provide a successful launch rate at or above 95 percent
- Procure commercial launch services consistent with mission criticality and procurement regulations
- Serve as Agency focal point and repository for ELV databases and advanced mission analyses
- Implement partnerships with other NASA Centers, academia, and industry to create new technological capabilities for lower costs and more reliable access to space

## ELV Program Organization





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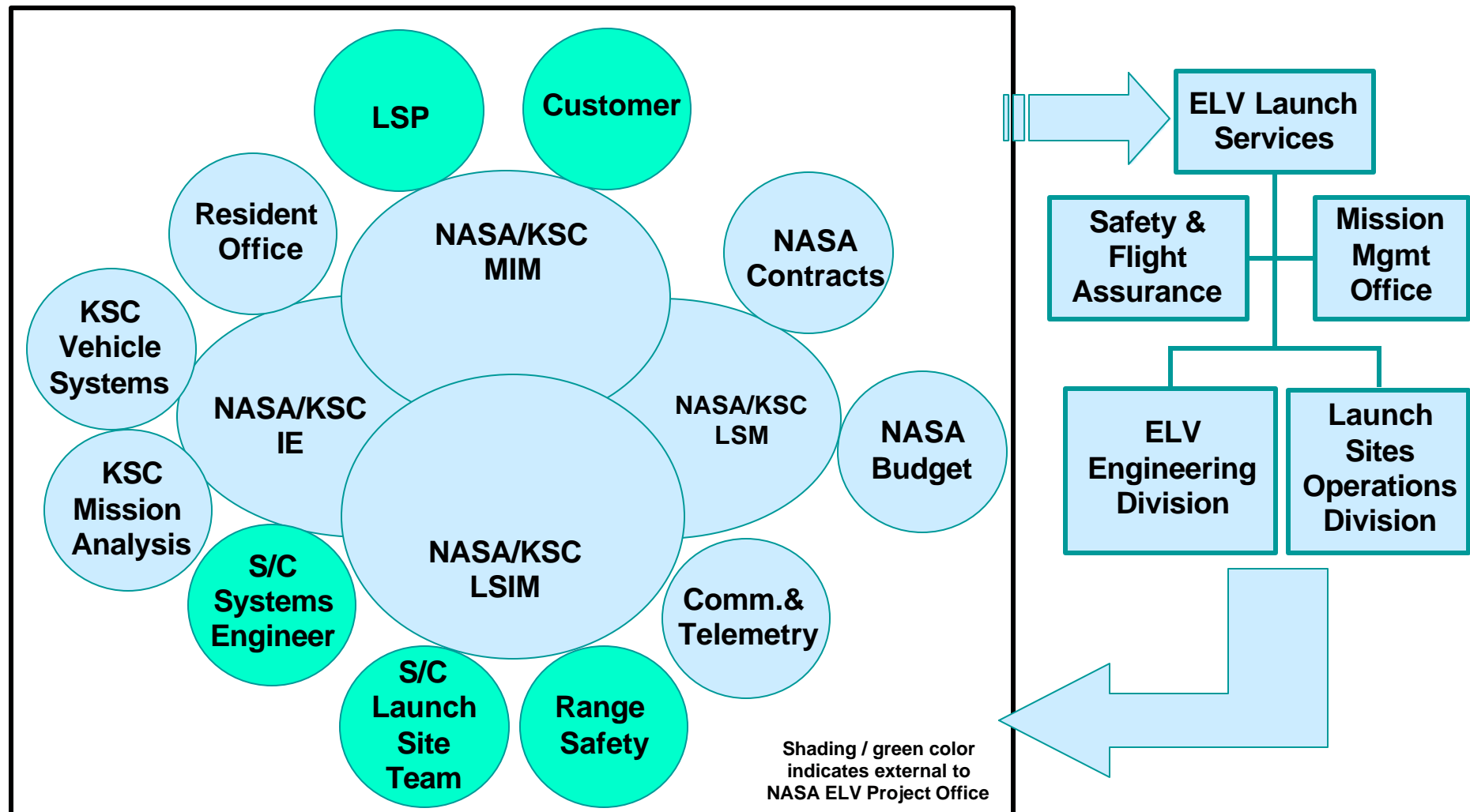
# Mission Integration Teams



# Mission Integration Team (MIT)

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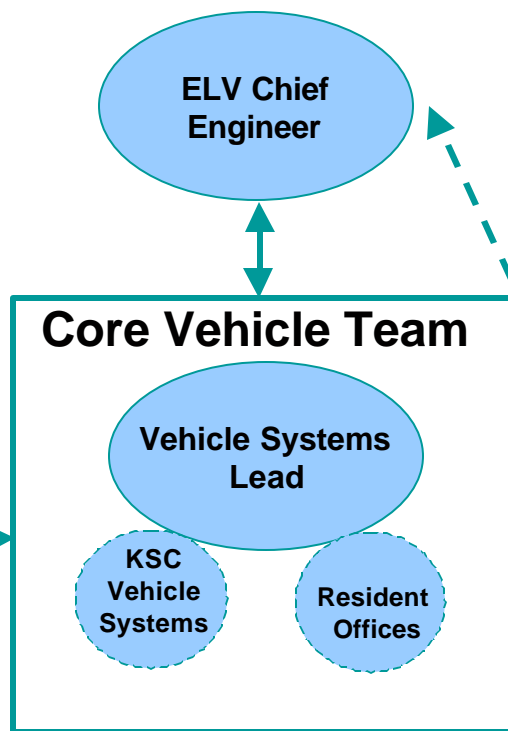


# Technical Information flow into the MIT

## Core Vehicle Test & Build

Integration & Test Facilities

Integrated Product Teams



ELV Chief Engineer

### Core Vehicle Team

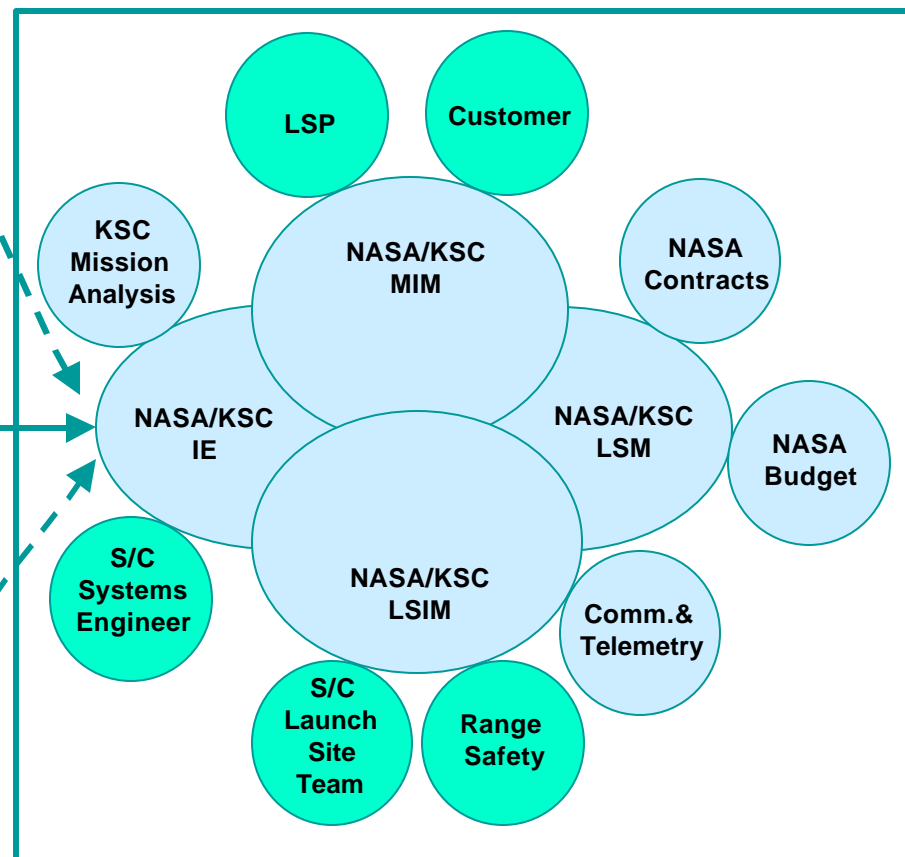
Vehicle Systems Lead

KSC Vehicle Systems

Resident Offices

Safety & Flight Assurance

## Mission Integration





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# **ELV Advance Mission Planning/Design Support**



# Advance Mission Planning/Design

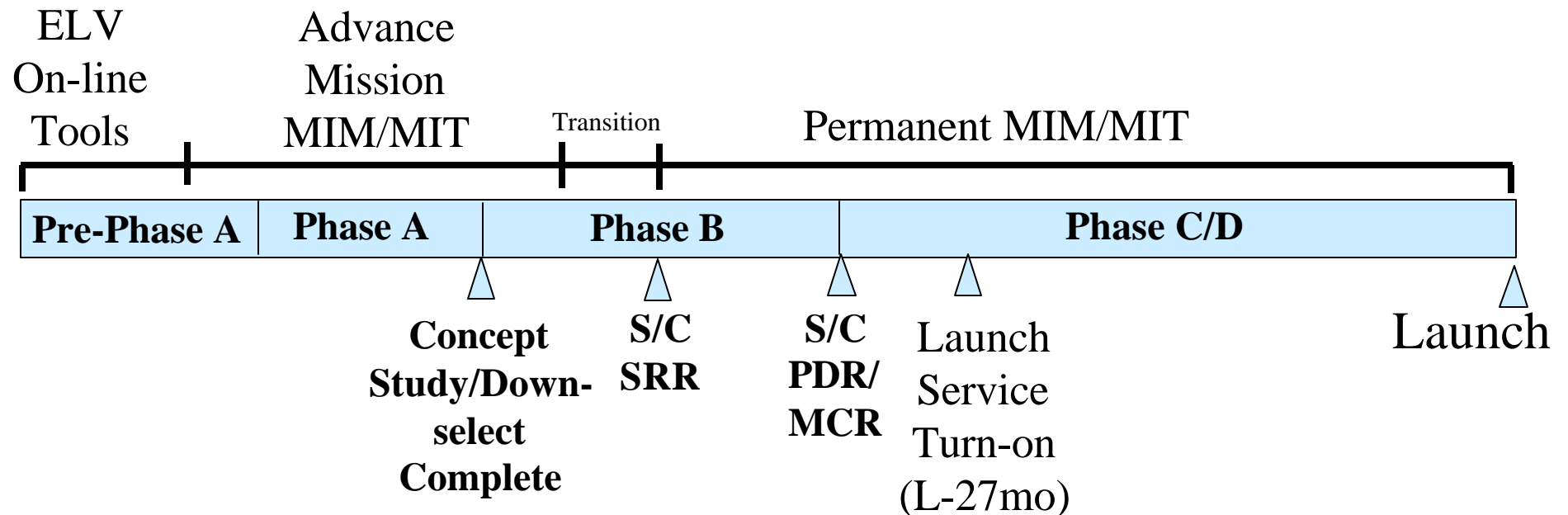
- **Advance Missions Team**
  - Mission Mgmt Office – Lead – Darrell Foster
  - Integration Engineering – Jim Robinson
  - Mission Analysis – Mike Carney
  - Program Integration Office
- **Provide a Focal Point into the ELV Org**
  - Customer Relations and Future Business Development
- **Support to Mission Formulation Team in performing LV trades**
  - Cost & Performance Quotes
  - Directed Missions
  - Potential Missions
  - Agency Initiatives
- **AO development, consultation, and evaluation**
- **Support to Independent Assessment Review Teams**
- **Work with the Launch Service Providers**
  - Future Business
  - Advance Mission Studies
- **Development/maintenance of on-line tools**
  - ELV Performance Web page
  - On-line Planner's Guide



# KSC ELV Involvement in Your Mission

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# Launch Services Contracts



# Contracts

- **Heritage Launch Service Contracts**

- MED-LITE CONTRACT: Medium-Lite Expendable Launch Vehicle Services (Med-Lite), NAS5-32933
  - Launch Service Contractor: Boeing – McDonnell Douglas Corporation
  - Type of Launch Service: Delta 7300; Delta 7400 and Taurus XL
- MELVS CONTRACT: Medium Expendable Launch Vehicle Services (MELVS), NAS5-30722
  - Launch Service Contractor: Boeing – McDonnell Douglas Corporation
  - Type of Launch Service: Delta II
- GOES CONTRACT: Geostationary Environmental Operational Satellite (GOES) Launch Services, NAS3-23440
  - Launch Service Contractor: Lockheed Martin Commercial Launch Services, Inc.
  - Type of Launch Service: Atlas I/IIA
- IELV CONTRACT: Intermediate Expendable Launch Vehicles (IELV) Launch Services, NAS3-27262
  - Launch Service Contractor: Lockheed Martin Commercial Launch Services, Inc.
  - Type of Launch Service: Atlas II/III
- VCL CONTRACT: Vegetation Canopy Lidar (VCL) Launch Service Contract, NAS5-99190
  - Launch Service Contractor: Lockheed Martin Commercial Launch Services (LMCLS)
  - Type of Launch Service: Athena I
- UELV CONTRACT: Ultralite Expendable Launch Vehicle (UELTV) Launch Services, NAS5-32836
  - Launch Service Provider: Orbital Sciences Corporation
  - Type of Launch Service: Pegasus and Taurus



## Contracts (cont'd)

- **KSC Issued Launch Service Contracts**

- SELVS-KSC CONTRACT: Small Expendable Launch Vehicle Services, NAS10-99005
  - Launch Service Contractor: Orbital Sciences Corporation
  - Type of Launch Service: Pegasus XL, Taurus
- SELVS-KSC CONTRACT: Small Expendable Launch Vehicle Services, NAS10-99010
  - Launch Service Contractor: Coleman Research Corporation, Coleman Aerospace Co.
  - Type of Launch Service: LK-0
- NLS CONTRACT: NASA Launch Services (NLS), NAS10-00-001
  - Launch Service Contractor: Delta Launch Services, Inc. (Boeing)
  - Type of Launch Service: Delta II, III, and IV
- NLS CONTRACT: NASA Launch Services (NLS), NAS10-00-060
  - Launch Service Contractor: Lockheed Martin Commercial Launch Services, Inc.
  - Type of Launch Service: Atlas III and V

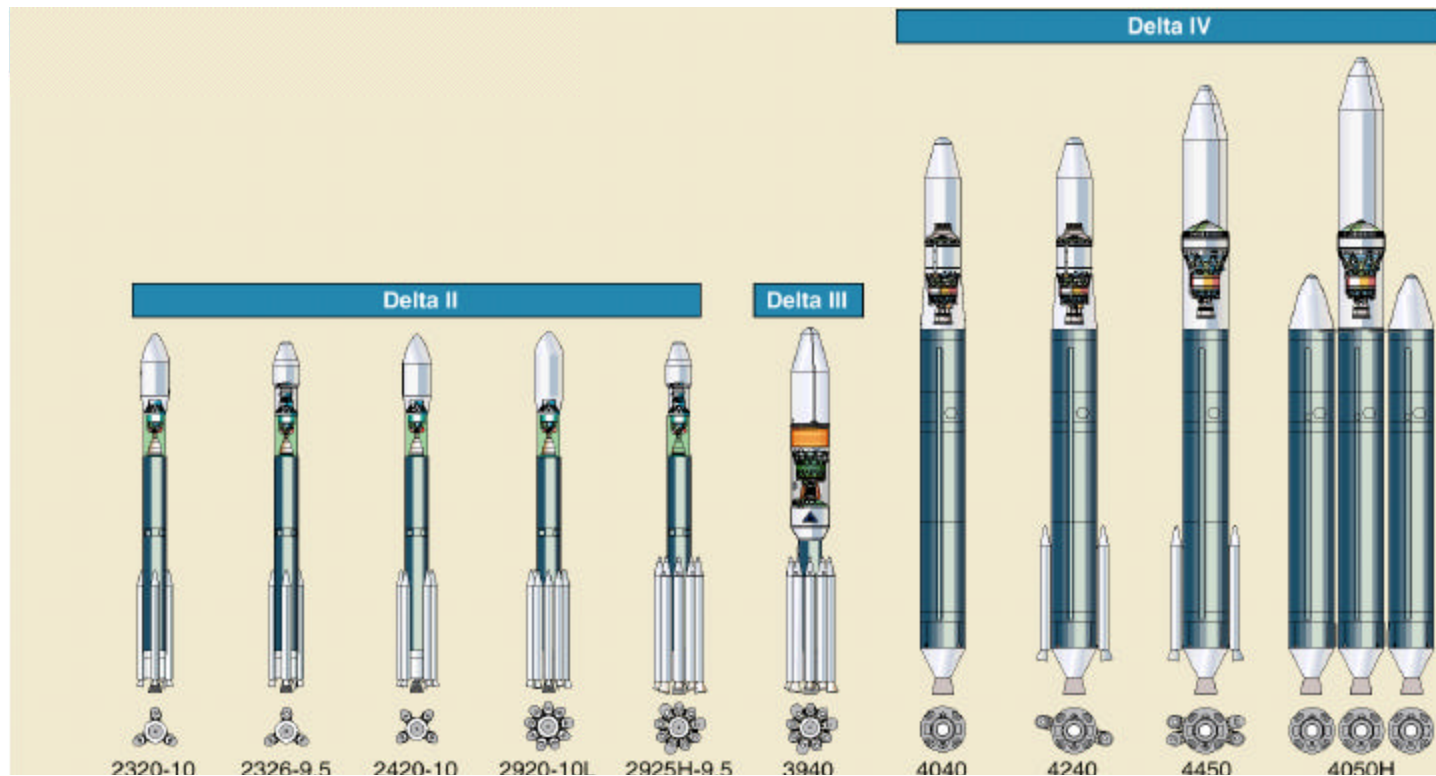


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# Boeing Delta Launch Services

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- The Boeing Delta II, Delta III and Delta IV family of launch vehicles are provided by the NASA Launch Services Contract







# Lockheed Martin Commercial Launch Services

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- The LMCLS Atlas III and Atlas V family of launch vehicles are provided by the NASA Launch Services Contract

NLS STANDARD LAUNCH VEHICLE CONFIGURATIONS							
Atlas IIIB (Single & Dual Engine Centaur)	Atlas V 401 Atlas V 402	Atlas V 501 Atlas V 502	Atlas V 511 Atlas V 512	Atlas V 521 Atlas V 522	Atlas V 531 Atlas V 532	Atlas V 541 Atlas V 542	Atlas V 551 Atlas V 552
							



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# Orbital Sciences Corporation

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## Pegasus XL



## Taurus





# Updated Launch Services Cost Figures

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**Launch Date: December 2004**

Launch Service	FY'02	FY'03	FY'04	FY'05	Total
Pegasus XL (VAFB)		14	5	7	26
Pegasus XL (CCAFS)		15	5	8	28
Pegasus XL (Equitorial)		16	6	9	31
Taurus (VAFB)		22	8	10	40
Taurus (CCAFS)		23	10	9	42
Delta II 7320 (VAFB)	14	20	21	3	58
Delta II 7320 (CCAFS)	13	19	20	3	55



# Updated Launch Services Cost Figures

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**Launch Date: December 2005**

Launch Service	FY'03	FY'04	FY'05	FY'06	Total
Pegasus XL (VAFB)		15	5	8	28
Pegasus XL (CCAFS)		15	6	9	30
Pegasus XL (Equitorial)		17	6	9	32
Taurus (VAFB)		24	8	11	43
Taurus (CCAFS)		24	9	12	45
Delta II 7320 (VAFB)	15	23	23	4	65
Delta II 7320 (CCAFS)	14	22	22	4	62



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# ELV Advance Mission Planning Support

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